What is claimed is:

1. A process for sealing a first coolant plate of an electrochemical cell with an adjacent plate, wherein the first coolant plate comprises at least one mating region for mating with a complementary region on the adjacent plate, wherein the adjacent plate is a second coolant plate or a bipolar plate of the electrochemical cell, and the first coolant plate and the adjacent plate each comprise a polymer and conductive filler, said process comprises the step of welding said mating region to said complementary region to create a seal formed by the polymer at the mating region and the complementary region.

2. The process of claim 1, wherein the welding step is selected from the group consisting of resistance welding, vibrational welding, ultrasonic welding, laser welding, heat lamination, and hot bonding techniques.

3. The process of claim 2, wherein the welding step is resistance welding.

4. The process of claim 3, wherein the resistance welding step comprises the further steps of:

   (a) placing the mating region and complementary region in close proximity to each other;

   (b) applying an electrical current between the first coolant plate and the adjacent plate to produce localized heat at the mating region and complementary region sufficient to melt the polymer at the mating region and complementary region; and

   (c) ceasing to apply the current and applying pressure to the first coolant plate and the adjacent plate to allow the melted polymer to cool and to create a seal at the mating region and complementary region.

5. The process of claim 4, wherein the electrical current is between about 0.1 amperes/mm^2 and about 5 amperes/mm^2, preferably between about 0.8 and

about 1.1 amperes/mm^2, its voltage is between about 5 and about 25 volts and the current is applied for a time from about 0.1 to about 100 seconds.

6. The process of claims 4 or 5 wherein the pressure applied is between about 1 and about 1000 psig, more preferably between 100 psig and 300 psig.

7. The process of any one of claims 4 to 6 wherein the electrical current is applied using either external electrodes or the plates themselves.

8. The process of claim 2, wherein the welding step is vibration welding.

9. The process of claim 8, wherein the vibration welding step comprises the further steps of:

   (a) placing the mating region and complementary region in close proximity to each other;

   (b) applying a vibrational force between the first coolant plate and the adjacent plate to produce localized heat at the mating region and complementary region sufficient to melt the polymer at the mating region and complementary region; and

   (c) ceasing to apply the vibrational force and applying pressure to the first coolant plate and the adjacent plate to allow the melted polymer to cool and to create a seal at the mating region and complementary region.

10. The process of claim 9, wherein the vibrational force is applied at a frequency of between about 100 and about 500 cycles per second for a time from about 3 to about 100 seconds at an amplitude of between about 0.5 and about 5 mm.

11. The process of claims 9 or 10, wherein the pressure applied is between about 1 and about 1000 psig, more preferably between 100 psig and 300 psig.

12. The process of any one of claims 1 to 11, wherein the polymer is a thermoplastic polymer selected from the group consisting of melt processible polymers, partially fluorinated polymers, thermoplastic elastomers, liquid crystalline polymers, polyolefins, polyamides, aromatic condensation polymers, liquid crystalline polymers and mixtures thereof.

13. The process of claim 12, wherein the polymer is a blend of about 1 wt% to about 30 wt%, preferably about 5 wt% to about 25 wt%, of maleic anhydride modified polymers with the thermoplastic polymer, partially fluorinated polymers and liquid crystalline polymer or mixtures thereof.

14. The process of any one of claims 1 to 13, wherein the conductive filler is graphite fiber or graphite powder.

15. The process of any one of claims 1 to 14, wherein the mating region comprises a first rib and the complementary region comprises a second rib or a groove.

16. The process of claim 15, wherein at least one of the first coolant plate and the adjacent plate comprise a polymer rich outer layer on either the mating region, the complementary region or both.

17. The process of claim 16, wherein the polymer rich outer layer comprises between about 25 wt% and about 100 wt% polymer, preferably between about 50 wt% and about 100 wt% polymer, and most preferably about 100 wt% polymer.

18. The process of any one of claims 1 to 17, wherein the mating region and the complementary region are located adjacent to the periphery of the first coolant plate and the adjacent plate.

19. The process of any one of claims 1 to 17, wherein the first coolant plate and the adjacent plate each comprise at least one manifold hole and the mating

region and the complementary region are at the periphery of the manifold holes.

20. The process of any one of claims 1 to 19, wherein the first coolant plate and the adjacent plate each comprise at least one flow field channel.

21. An electrochemical cell component comprising a first coolant plate sealed to an adjacent plate using the process of any one of claim 1 to 20.

22. An electrochemical cell comprising a first coolant plate and an adjacent plate, wherein the first coolant plate is sealed to the adjacent plate using the process of any one of claims 1 to 20.

23. An electrochemical cell comprising the fuel cell component of claim 21.

24. An electrochemical cell stack comprising a plurality of the electrochemical cells of claims 22 or 23.

25. The cell component of claim 21, wherein the cell component has a contact resistance less than the contact resistance of two plates that are not joined together.

26. The cell component of claim 21 or 25, wherein the cell component has a contact resistance that is independent of compression pressure applied to the cell component.